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IMPACT OF FEDERAL NOISE ABATEMENT POLICY ON AIRCRAFT FINANCING

W. PHILLIP WHITCOMB

On November 18, 1976, the then Secretary of Transportation, William T. Coleman, and the Administrator of the Federal Aviation Administration (FAA), John L. McLucas, announced the federal government's noise abatement policy.¹ This policy establishes a timetable which requires all domestic commercial aircraft weighing in excess of 75,000 pounds to meet Federal Aviation Regulation Part 36 (FAR 36)² noise limits by January 1, 1985.³ Compliance with the prescribed noise limits could be effectuated by either aircraft replacement or by the retrofit of existing non-complying aircraft with sound absorbing material or more technologically advanced engines. In order to meet these required standards, the expenditure of a considerable amount of capital will be required by the nation's domestic airline industry. Such a massive outlay of capital will directly affect the ability of an already financially troubled industry to support the research and development, not to mention the procurement, of new technologically advanced equipment.

FAR 36 Noise Limits and Scheduled Compliance

Part 36 of the Federal Aviation Regulations, which became effective on December 1, 1969,⁴ was adopted to implement 49 U.S.C. 1431⁵ and provides "present and future relief and protection to the public from unnecessary aircraft noise and sonic booms"⁶ The purpose of FAR 36, to prevent further escalation of aircraft noise, is accomplished by prescribing noise standards for

¹ U.S. DEPT OF TRANSPORTATION, AVIATION NOISE ABATEMENT POLICY (1976).

² 14 C.F.R. § 36 (1977).

³ 14 C.F.R. § 91.305 (1977).

⁴ 34 Fed. Reg. 18,355 (1969).

⁵ 49 U.S.C. § 1431 (1970), as amended by Pub. L. No. 90-411, § 1, 82 Stat. 395.

⁶ 49 U.S.C. § 1431 (1970).

the type certification⁷ of subsonic transport category aircraft and for the type certification of subsonic turbojet powered aircraft regardless of category.⁸ This amendment to the Federal Aviation Regulations initiated the noise abatement regulatory program of the FAA under the statutory authority established by Congress in the Federal Aviation Act of 1958.⁹

Since the adoption of FAR 36, the FAA has adopted additional amendments to FAR 36 which have increased the protection of the public from aircraft noise by providing more stringent noise levels. These levels must be met before type certification of an aircraft is awarded by the FAA. The most recent of these amendments,¹⁰ which became effective October 1, 1977, provides (1) three stages of aircraft noise levels with specified noise limits, (2) definitions for classifying aircraft under each stage, (3) requirements that applicants for new type certifications on or after November 5, 1975, must comply with the noise limits established under "Stage 3," and (4) acoustical change requirements for airplanes in each noise level stage.¹¹ Thus, FAR 36, as amended, establishes three stages of aircraft noise levels and defines which airplanes qualify under each stage.¹²

⁷ A type certification is granted by the FAA to establish the airworthiness of each new distinctive model of aircraft as designated by the manufacturer.

⁸ 34 Fed. Reg. 18,355 (1969).

⁹ Federal Aviation Act of 1958, 72 Stat. 731, *as amended*, 49 U.S.C. §§ 1301 *et seq.* (1970 & Supp V 1975), *formerly* Civil Aeronautics Act of 1938, ch. 601, 52 Stat. 973.

¹⁰ 42 Fed. Reg. 12,360 (1977).

¹¹ This amendment provides more restrictive noise levels than did previous standards by approximately two EPNdB. (Noise levels are measured as effective perceived noise in decibels—EPNdB.) The FAA has further proposed even more restrictive noise levels based upon draft modifications to the International Civil Aviation Organization's Annex 16 noise levels in a Supplemental Notice of Proposed Rulemaking, Notice No. 75-37C, 41 Fed. Reg. 47,375 (1976).

¹² A "Stage 1" airplane is defined as an airplane which does not comply with the takeoff, sideline, and approach noise levels of "Stage 2" or "Stage 3" airplanes. 42 Fed. Reg. 12,360, 12,371 (1977) (to be codified as 14 C.F.R. § 36.1(f)(2)).

A "Stage 1" airplane may not, after changes in the type's design, exceed noise levels created before such changes were made. 42 Fed. Reg. 12,371 (1977). Under "Stage 1" the tradeoff provisions of section C36.5(b) of Appendix C of FAR 36 may not be applied to increase noise levels. *See* 42 Fed. Reg. 12,360, 12,372 (1977) (to be codified as 14 C.F.R. § C36.5(b)).

A "Stage 2" airplane is defined as an airplane that has been shown under this Part to comply with "Stage 2" noise levels. The Stage 2 noise levels, regardless of the number of engines, are as follows:

These noise limits will require an average decrease in noise

- (i) *For takeoff*—108 EPNdB for maximum weights of 600,000 pounds or more, reduced by 5 EPNdB per halving of the 600,000 pounds maximum weight down to 93 EPNdB for maximum weights of 75,000 pounds and less.
- (ii) *For sideline and approach*—108 EPNdB for maximum weights of 600,000 pounds or more, reduced by 2 EPNdB per halving of the 600,000 pounds maximum weight down to 102 EPNdB for maximum weights of 75,000 pounds and less. 42 Fed. Reg. 12,360, 12,372 (to be codified as 14 C.F.R. § C36.5(a)(3)).

A "Stage 3" airplane must meet the more restrictive "Stage 3" noise limits (42 Fed. Reg. 12,360, 12,371 (1977)) with the application of tradeoff provisions. These noise levels vary with the number of engines powering an airplane, and are as follows:

- (i) *For airplanes with more than 3 engines*—
 - (A) *For takeoff*—106 EPNdB for maximum weights of 850,000 pounds or more, reduced by 4 EPNdB per halving of the 850,000 pounds maximum weight down to 90 EPNdB for maximum weights of 53,125 pounds and less;
 - (B) *For sideline*—103 EPNdB for maximum weights of 850,000 pounds or more, reduced by 2.56 EPNdB per halving of the 850,000 pounds maximum weight down to 96 EPNdB for maximum weights of 75,130 pounds and less; and
 - (C) *For approach*—105 EPNdB for maximum weights of 850,000 pounds or more, reduced by 2 EPNdB per halving of the 850,000 pounds maximum weight down to 98 EPNdB for maximum weight of 75,130 pounds and less.
- (ii) *For airplanes with 3 engines*—
 - (A) *For takeoff*—104 EPNdB for maximum weights of 850,000 pounds or more, reduced by 4 EPNdB per halving of the 850,000 pounds maximum weight down to 90 EPNdB for maximum weights of 75,130 and less;
 - (B) *For sideline*—103 EPNdB for maximum weights of 882,000 pounds or more, reduced by 2.56 EPNdB per halving of the 882,000 pounds maximum weight down to 96 EPNdB for maximum weights of 132,538 pounds and less; and
 - (C) *For approach*—105 EPNdB for maximum weights of 850,000 pounds or more, reduced by 2 EPNdB per halving of the 850,000 pounds weight down to 98 EPNdB for maximum weights of 75,130 pounds and less.
- (iii) *For airplanes with fewer than 3 engines*—
 - (A) *For takeoff*—101 EPNdB for maximum weights of 850,000 pounds or more, reduced by 4 EPNdB per halving of the 850,000 pounds maximum weight down to 89 EPNdB for maximum weights of 106,250 pounds and less;
 - (B) *For sideline*—103 EPNdB for maximum weights of 882,000 pounds or more, reduced by 2.56 EPNdB per halving of the 882,000 pounds maximum weight down to 94 EPNdB for maximum weights of 77,120 pounds and less; and
 - (C) *For approach*—105 EPNdB for maximum weights of 850,000 pounds or more, reduced by 2 EPNdB per halving of the 850,000 pounds weight down to 98 EPNdB for maximum weights of 75,130 pounds and less. 42 Fed. Reg. 12,360, 12,372 (1977) (to be codified as 14 C.F.R. § C36.5 (a)(3)).

levels of twelve to sixteen EPNdB from first generation turbojet aircraft.¹³ This reduction of noise at the source, when combined with new approach and takeoff procedures, would substantially decrease the perceptible noise levels emitted by individual aircraft. Due to a forecasted aviation growth, however, the aircraft noise problem is expected to increase despite the introduction of quieter aircraft. Between 1975 and 1990, annual aircraft operations are expected to increase from ten million to sixteen million, creating additional noise exposure that could more than offset the reduction in noise levels resulting from the replacement of the older aircraft by newer, quieter models.¹⁴

At the end of 1975, there were 2,148 jet aircraft in service with the United States air carrier fleet.¹⁵ Of these 2,148 aircraft, it is estimated that 1,586 do not conform to FAR 36¹⁶ and must be replaced or retrofitted in order to comply with the prescribed noise limits. Moreover, assuming the normal attrition of pre-FAR 36 aircraft,¹⁷ it is estimated by the FAA that between 1,171 and 1,246 aircraft will still fail to comply with FAR 36 in 1984,¹⁸ and that by 1990 there will be only a fifty-two percent compliance.¹⁹

In order to accelerate compliance by the airlines with FAR 36, the Department of Transportation and the FAA amended the Federal Aviation Regulations²⁰ to include a timetable for progres-

¹³ U.S. DEP'T OF TRANSPORTATION, AVIATION NOISE ABATEMENT POLICY 39 (1976).

¹⁴ *Id.* at 23.

¹⁵ *Id.* at 22.

¹⁶ Breakdown of aircraft which do not meet FAR 36 requirements (prior to Amendment 7 becoming effective):

Boeing 707/720 & DC-8	(4 engine)	508
Boeing 727	(3 engine)	590
Boeing 737/DC-9/BAC-111	(2 engine)	488
Total		1,586

The Future of Aviation: Hearings before the Subcomm. on Aviation and Transportation R & D of the House Comm. on Science and Technology, 94th Cong., 2d Sess. 616 (1976) (statement by John L. McLucas) [hereinafter cited as McLucas].

¹⁷ Those aircraft produced prior to the adoption of FAR 36 in 1969 were not required to meet the standards implemented by the regulation. U.S. DEP'T OF TRANSPORTATION, AVIATION NOISE ABATEMENT POLICY 22 (1976).

¹⁸ R.K. ELLINGSWORTH, *Administration Sets Noise Policy*, AV. WEEK & SPACE TECH., Nov. 22, 1976, at 13 [hereinafter cited as Ellingsworth].

¹⁹ U.S. DEP'T OF TRANSPORTATION, AVIATION NOISE ABATEMENT POLICY 23 (1976).

²⁰ 41 Fed. Reg. 56,046 (1976) amended FAR 91 to include a specific timetable

sive compliance of all domestic commercial aircraft by January 1, 1985.²¹ This schedule requires the compliance of all Boeing 707's and 720's and McDonnell Douglas DC-8's with FAR 36 noise levels within eight years, with one quarter of the above mentioned fleet complying within four years and one-half within six years.²² The schedule requires all other noncomplying aircraft types²³ to be in compliance with FAR 36 noise levels within six years, with one-half of these aircraft complying within four years.²⁴ Exceptions to these time limits would occur for noncomplying aircraft when replacement airplanes²⁵ have been ordered and are scheduled for delivery prior to January 1, 1985. This exception would exist only under a plan approved by the FAA, however, and would be effective only to the date specified in that plan.²⁶

This progressive compliance schedule was developed by the FAA to permit the airlines sufficient time to determine whether a retrofit of existing aircraft with sound absorbing materials or refanned engines would be sufficiently effective in meeting the FAR 36 noise limits, or whether a replacement program utilizing the most technologically advanced aircraft available would be preferred.²⁷ A combination of these programs would seem most logical. Many aircraft may be too close to the end of their projected life to invest the capital necessary for retrofitting, while other aircraft possessing an adequate remaining life could be economically retrofitted. How-

for aircraft operated under certificates issued under FAR 121 and 135. See 14 C.F.R. § 91.305(b) (1977).

²¹ 14 C.F.R. § 91.305(c) (1977).

²² 14 C.F.R. § 91.305(b)(1)(i), (b)(2)(i) (1977). These regulations include all aircraft which have four engines with no bypass ratio or a bypass ratio less than two. (A bypass ratio represents a ratio of the amount of ingested air which bypasses the jet engine core (fan flow) to the amount of air that passes through the jet engine core (core engine flow).)

²³ Proposed legislation would exempt all two and three engine aircraft from compliance until 1990. See R.K. Ellingsworth, *House Unit Eases Noise Rule Deadline*, AV. WEEK & SPACE TECH., July 4, 1977, at 26. Aircraft falling within this category would include all two and three engine noncomplying aircraft now being operated by the domestic carriers (B-727s and 737s, DC-9s, and BAC-111s), and the noncomplying Boeing 747s.

²⁴ 14 C.F.R. §§ 91.305(b)(1)(ii), (b)(2)(ii) (1977).

²⁵ 14 C.F.R. § 91.305(c) (1977). A replacement airplane is defined as one which is shown to comply with Part 36 prior to the issuance of an original standard airworthiness certificate.

²⁶ *Id.*

²⁷ 41 Fed. Reg. 56,050 (1976).

ever, the action taken by any carrier will greatly depend upon the ability of that carrier to generate the necessary capital to finance any given plan.

Financial State of the Industry

Since the peak years in the mid-1960's, the operating performance²⁸ of the nation's airlines, particularly the domestic trunk carriers, has deteriorated significantly.²⁹ As the industry's operating performance has declined, so has its gross revenues and net profits. At the same time, debt to equity ratios have increased, and debt financing or the sale of equity and subordinated debentures in the public market has become extremely difficult.³⁰

This erosion of the airline industry's financial base has been caused by several factors. The industry's current problems originated in the late 1960's with the placement of initial orders for wide-bodied airplanes.³¹ By 1968, the carriers had experienced twenty-eight years of continuous traffic growth which had averaged eighteen percent per year.³² This growth, coupled with increased operating efficiencies, resulted in an industry-wide annual net profit of 5.75 percent from 1964 to 1968.³³ In 1968, the industry's outlook was favorable due to the strong U.S. economy and the anticipation of further traffic growth being forecast by both industry and government.³⁴ With this bright forecast and the industry being federally regulated, the financial community allowed the debt to

²⁸ An airline's operating performance is a reflection of its efficiency with regard to minimizing expenses (labor, fuel costs, maintenance, new equipment acquisitions, etc.) while maximizing its operating revenues (air fares and way-bills).

²⁹ *Aviation Economics: Joint Hearings Before the Subcomm. on Investigations & Review and the Subcomm. on Aviation of the House Comm. on Public Works and Transportation*, 94th Cong., 2d Sess. 583 (1976) (statement by Frederick W. Bradley, Jr.) [hereinafter cited as Bradley, *Aviation Economics*].

³⁰ Due to current poor earnings, unresponsiveness of the CAB, and apprehensions surrounding the current deregulation proposals, the airlines have been unable to raise any equity, near-equity (subordinated, convertible debentures) or straight debt. There has been no airline equity offer since July 11, 1972, and no other form of public offering (excluding exchange offers) since January 17, 1973. Bradley, *Aviation Economics*, *supra* note 29, at 585.

³¹ Bradley, *Aviation Economics*, *supra* note 29, at 584.

³² *Id.*

³³ *Id.*

³⁴ *Id.*

equity ratio of the carriers to climb above those accepted by financial institutions for nonregulated businesses.³⁵

Since 1968, however, the carrier's financial base has gradually weakened. The high levels of traffic growth required to fill the increased capacity offered by the introduction into service of wide-bodied aircraft in 1970 never materialized. The growth of traffic volumes had virtually ceased by 1974.³⁶ Coupled with this decrease in the growth of traffic volume was a substantial increase in industry-wide operating costs. Especially steep have been the increases recorded for labor and fuel.³⁷ Labor costs represent about forty percent of the total operational costs in the industry today.³⁸ The average cost per employee was approximately \$21,000 in 1975, up from \$17,000 in 1973, or twelve percent in two years.³⁹ Increases in the cost of jet fuel have been even more pronounced. While accounting for approximately twenty percent of the airline's operating expense, the cost per gallon of domestic fuel has jumped from twelve cents to thirty-one cents since mid-1973; a 150 percent increase.⁴⁰ Despite total fuel consumption in 1975 below the 1973

³⁵ The regulated environment of the commercial aviation industry was perceived to limit the business risk involved in lending above the more accepted debt to equity ratio of one to one, the uppermost limit which institutional lenders would tolerate in an unregulated industry. A ratio of two to one has become the maximum allowable in a regulated industry. See Bradley, *Aviation Economics*, *supra* note 29, at 584, 588. For private carriers, institutional lenders like to see private airline customers have a debt to equity ratio of under 1.5:1, defining debt to include capitalized leases and equity to include subordinated debt and preferred stock. For government-owned or -supported carriers, a higher debt to equity relationship is permitted. 33 INTERAVIA 43 (1977) (statement by Frederick W. Bradley, Jr.).

³⁶ In 1974, traffic growth (in passenger miles) measured only a 0.6% increase over 1973 for U.S. scheduled airlines. *The Future of Aviation: Hearings Before the Subcomm. on Aviation and Transportation R & D of the House Comm. on Science & Technology*, 94th Cong., 2d Sess. 429 (1976) (statement by Karl G. Harr, Jr.) [hereinafter cited as Harr].

³⁷ Since 1968, the industry has experienced a 186% increase in the price of fuel and a 93% increase in the cost of labor, only partially offset by higher fares. Bradley, *Aviation Economics*, *supra* note 29, at 584.

³⁸ *The Future of Aviation: Hearings before the Subcomm. on Aviation and Transportation R & D of the House Comm. on Science and Technology*, 94th Cong., 2d Sess. 505 (1976) (statement by George W. James) [hereinafter cited as James].

³⁹ *Aviation Economics: Joint Hearings before the Subcomm. on Investigations & Review and the Subcomm. on Aviation of the House Comm. on Public Works and Transportation*, 94th Cong., 2d Sess. 582 (1976) (statement by George P. Jenkins) [hereinafter cited as Jenkins].

⁴⁰ *Id.*

rate, the industry spent \$1.6 billion more for fuel in 1975 than in 1973.⁴¹ Fuel costs will continue to increase as old fuel acquisition contracts expire and new ones are negotiated by the airlines.⁴² Labor costs will likewise increase.⁴³ In addition, cost increases due to inflation have been recorded for other goods and services consumed by the airlines.⁴⁴ These include food, spare parts, landing fees (up 140 percent since 1967), rentals, ground vehicles, travel agent commissions, construction, and maintenance—all the necessary services to operate an airline.⁴⁵

While all operating expenses have steadily increased, the average airline ticket price has not demonstrated a proportionate increase. Between 1948 and 1975, the Consumer Price Index increased 123 percent while the average airfare increased only twenty-two percent.⁴⁶ From 1965 to 1975, the passenger yield (average fare per passenger mile) has increased thirty percent while total unit costs have increased about forty percent.⁴⁷ Despite a recent increase in traffic growth,⁴⁸ the lag of fare increases well behind increased costs has resulted in operational expenses exceeding operational revenues. This has occurred despite the fact that 100 aircraft have been grounded and that the industry's labor force has been cut by 10,000 workers.⁴⁹ The end result has been a substantial decrease in net profits.⁵⁰

These increased expenses, when coupled with the excess seating

⁴¹ *Id.*

⁴² Bradley, *Aviation Economics*, *supra* note 29, at 584.

⁴³ Standard & Poors estimates that labor costs will continue to rise at a 10-11% annual rate. T. Canning, *Air Transportation Analysis*, STANDARD & POORS INDUSTRY SURVEYS at A64 (1977).

⁴⁴ The rate of U.S. inflation as measured by the Consumer Price Index increased from 1.7% in 1965 to 9.7% in 1975. James, *supra* note 38, at 504.

⁴⁵ Jenkins, *supra* note 39, at 582.

⁴⁶ James, *supra* note 38, at 505.

⁴⁷ *Id.* at 504.

⁴⁸ Overall domestic traffic for the trunk airlines scored a full-year gain of 10% in 1976. T. Canning, *Air Transportation Analysis*, STANDARD & POORS INDUSTRY SURVEYS at A63 (1977).

⁴⁹ James, *supra* note 38, at 504.

⁵⁰ For the six years from 1970 (the year of the first widebodied delivery) through 1975, the industry earnings averaged \$78 million on average total revenues of \$10,773 million for a net margin of only .72%. In 1975, the airlines' performance was particularly poor with the domestic trunks plus Pan Am losing 73.5 million on revenues of \$14,146 million. Bradley, *Aviation Economics*, *supra* note 29, at 584.

capacity generated by the overly-optimistic ordering of wide-bodied airplanes and the decrease in traffic volume, have resulted in reduced profit margins. In 1965, the industry's earnings reached \$367 million.⁵¹ Since then the industry's average annual earnings have been only \$160 million.⁵² Expressed in terms of profit margins, the industry earned 7.4 cents on the dollar in 1965, averaged 1.6 cents for the decade 1966-1975, and lost 0.7 cents in 1975.⁵³ During the early 1970's, the U.S. airlines' return on investment fluctuated from 1.2 percent in 1970 to a high of 6.4 in 1974.⁵⁴ In 1975, the industry's return on investment was \$900 million below the CAB standard.⁵⁵ Despite an increase in traffic volume in 1976,⁵⁶ the profit margin was only 2.5 percent;⁵⁷ still far below the CAB recommended standard for a healthy airline industry. Without substantial increase in the return on investment, the airlines are not capable of internally generating the sums of cash required to finance new technologically advanced equipment or to retrofit existing equipment for compliance with FAR 36 noise requirements.

This low rate of return on investment created a need for the airlines to turn to alternate forms of financing for new equipment. This resulted in debt financing through commercial banks and insurance companies. With a substantial outstanding debt⁵⁸ and no new equity offerings since 1973,⁵⁹ some airline's debt/equity ratios have become unacceptable to the major commercial lending institutions.⁶⁰ Institutional lenders (mainly insurance companies)

⁵¹ James, *supra* note 38, at 504.

⁵² *Id.*

⁵³ *Id.*

⁵⁴ Harr, *supra* note 36, at 429.

⁵⁵ In 1975, the industry lost approximately \$100 million while the industry required a net earning of \$800 million to meet the CAB standard of 12% return on investment. Harr, *supra* note 36, at 429.

⁵⁶ See note 48 *supra*.

⁵⁷ D.W. Sommers, *Financial Analysis of Industry 1976-1977*, INDUSTRY WEEK, March 28, 1977, at 65.

⁵⁸ The industry's present outstanding debt is the result of long-term loans for financing new equipment, most notably the wide-bodied aircraft, and net operating losses in fiscal years 1973 and 1975.

⁵⁹ See note 30 *supra*.

⁶⁰ Debt to equity ratios varied from a low of 64:36 to a high of 85:15 for the four domestic airlines in which Metropolitan Life Insurance Company has invested (Pan Am, American, TWA, and United Airlines). In an unregulated industry

have likewise become hesitant to provide financing.⁶¹ Equity financing has also become impractical as the market value of the airlines' equity shares has declined below book value.⁶² With such traditional sources of public financing strained at best, the airline industry will be hard pressed to raise funds for future growth and replacement to comply with FAR 36 guidelines.

Adding to the problems of poor earnings, a high debt/equity ratio, and the difficulty of obtaining public financing is the uncertainty created by potential deregulation of the industry. In early 1977, Senators Howard Cannon and Edward Kennedy introduced the Air Transportation Regulatory Reform Act of 1977.⁶³ Under this Act, Congress proposes to return the industry to profitability by reforming the present regulatory structure of the industry over a gradual period of years, thereby increasing competition within the industry.⁶⁴ Deregulation, however, would create uncertainty in the financial community due to an inability to project a carrier's future operating results stemming from the lender's inability to fully predict in advance the nature of the competitive environment.⁶⁵ This uncertainty would make it extremely difficult to structure any financing for several years, further complicating the ability of the industry to obtain public financing to meet FAR 36. In light of the high debt/equity ratios which would remain after deregulation, it seems unlikely that any financing could be obtained until said ratios were reduced to those levels acceptable for nonregulated industries.⁶⁶ Taking into consideration the industry's equipment needs for growth, replacement, and increasing operating efficiencies inherent in new technology, the inability of the industry

the lending community would find any ratio greater than 40:60 unacceptable; however, in the airline industry the ratio is higher. Jenkins, *supra* note 39, at 580.

⁶¹ In addition to unreasonably high debt to equity ratios, the insurance companies were primary lenders for the wide-bodied aircraft. At present the insurance companies, the main source of long-term debt financing, hold \$2.6 billion of airline debt. Bradley, *Aviation Economics*, *supra* note 29, at 585.

⁶² For example, at the end of 1966, the market value of trunk airline equities was \$6.7 billion and the book value was \$2.4 billion. In the third quarter of 1975, the market value had fallen to \$2.5 billion and the book value had risen to \$4.1 billion. James, *supra* note 38, at 507.

⁶³ S. 689, 95th Cong., 1st Sess. (1977).

⁶⁴ Bradley, *Aviation Economics*, *supra* note 29, at 583.

⁶⁵ *Id.* at 587.

⁶⁶ *Id.* at 589.

to gain the necessary financing would be devastating.

As can be seen, the industry's financial state is quite poor. Without timely rate increases by the CAB to offset the rising operational costs caused by inflation, the industry will not be able to reduce its debt significantly before present fleets of aircraft become economically obsolete. Likewise, without substantially increased profit margins, financing of the next generation of aircraft will be extremely difficult, not to mention the fiscal resources which will be needed to meet the schedule for compliance with FAR 36.

Cost of Compliance with FAR 36 and Future Growth

The FAA has estimated that the cost of compliance with FAR 36 will ultimately increase by \$5.5 to 7.6 billion the amount of capital needed in 1985 by the airline industry.⁶⁷ Cost projections range from \$740 million to \$1.5 billion for the retrofit of all aircraft which do not comply with FAR 36⁶⁸ with quiet nacelles.⁶⁹ As an alternative, it would cost from \$7.7 to 9.7 billion to replace all four engine turbojet aircraft (Boeing 707's and 720's and McDonnell Douglas DC-8's) with a new technologically advanced design and retrofit the remaining noncomplying aircraft with quiet nacelles.⁷⁰ The exact cost of complying with FAR 36 noise regulations will depend upon the replacement needs of the individual airlines and the compliance status of their existing fleets.

The retrofitting of existing aircraft with redesigned engine nacelles containing sound absorbing materials provides the cheapest means of compliance with FAR 36. The procedure of retrofitting this equipment to specific aircraft can be accomplished by the maintenance facilities of the individual airlines.⁷¹ The price of a shipset⁷² would vary between \$1.1 million in 1977 and \$1.6 million

⁶⁷ Ellingsworth, *supra* note 18, at 13.

⁶⁸ *Id.*

⁶⁹ An engine nacelle is the protective enclosure surrounding the engine.

⁷⁰ Ellingsworth, *supra* note 18, at 23.

⁷¹ Downtime for an aircraft having redesigned nacelles installed would vary from 16 to 23 days for a Boeing 707 to seven hours for a Boeing 737. *Airport & Aircraft Noise Reduction: Hearings before the Subcomm. on Aviation of the Comm. on Public Works and Transportation, 95th Cong., 1st Sess. 88-89 (1977)* (statement by Vaughn L. Blumenthal) [hereinafter cited as Blumenthal].

⁷² A shipset represents the number of quiet nacelles necessary to retrofit a single airplane.

in 1981⁷³. The cost of retrofitting two- and three-engine turbofan airplanes would be significantly lower; \$163,000 for a Boeing 727 and \$220,400 for a Boeing 737.⁷⁴ Effective compliance for all types of aircraft could be accomplished by the January 1, 1985, deadline, assuming that the manufacturers receive the necessary production orders by the end of 1977.⁷⁵

Despite the relatively inexpensive means of compliance this type of retrofitting offers when compared with other alternatives, drawbacks do exist in its application. One of the primary concerns with this type of retrofitting is that no guarantee exists that a further reduction in the acceptable noise limits of FAR 36 will not occur.⁷⁶ Such a reduction in FAR 36 noise levels would require additional expenditures of fiscal resources on aircraft which are the product of twenty to twenty-five year old technology.⁷⁷ The use of sound absorbing materials in engine nacelles will meet current FAR 36 noise levels. Aircraft so retrofitted, however, will not be able to meet the most recent noise abatement proposals set forth by the FAA.⁷⁸ Further, the return on investment for retrofitting with sound absorbing materials would not provide any improvement in fuel consumption or reduction in emission of air pollutants which can be had with new technologically advanced equipment. Rather, the redesigned nacelles would result in weight and performance loss by the modified aircraft.⁷⁹ With the constant increase in the

⁷³ These prices are based upon an assumed retrofit of 400 aircraft. Blumenthal, *supra* note 71, at 87-88. The cost for a set of quiet nacelles for a Boeing 707 could run as high as \$2.5 million depending upon the quantity sold and time of purchase.

⁷⁴ *Id.* at 88.

⁷⁵ Retrofit kits for the Boeing 707 would be available for installation on existing aircraft 28 months after receipt of sufficient firm orders for Boeing to order a production go-ahead. For two- and three-engine aircraft the kits are already available and are factory installed on new production aircraft. *Id.*

⁷⁶ Proposed reductions to FAR 36 noise limits have already been published by the Environmental Protection Agency in the *Federal Register*. See Notice for Proposed Rulemaking No. 76-22, 41 Fed. Reg. 47,358 (1976).

⁷⁷ *Airport & Aircraft Noise Reduction: Hearings before the Subcomm. on Aviation of the Comm. on Public Works and Transportation, 95th Cong., 1st Sess. 203 (1977) (statement by Frank Borman).*

⁷⁸ The Environmental Protection Agency (EPA) has proposed a further reduction in noise levels. See FAA 75-37C, 41 Fed. Reg. 47,375 (1976).

⁷⁹ Data from the airframe manufacturers to the Air Transportation Association indicates that if all non-FAR 36 aircraft in the U.S. fleet were retrofitted to meet the 1969 version of FAR 36 noise rules, it would increase fuel consumed by

price of fuel, a proportionate increase in equipment efficiency becomes mandatory to offset this increased expense.

Some of the problems presented by retrofitting existing aircraft with quiet nacelles can be solved by alternative means, although they require an increase in cost. The concept of using new engine technology on existing airframes provides an alternative to retrofitting with quiet nacelles where the aircraft still possesses a substantial useful life. New technology engines would provide improved fuel economy and less pollution, while at the same time providing better than minimal conformance with the FAR 36 requirements.⁸⁰

The technology presently exists to re-engine all non-complying aircraft. The Pratt & Whitney JT8D-209⁸¹ and the General Electric/SNECMA CFM56⁸² both provide an alternative power source for modification of existing fleets of narrow-bodied aircraft, providing both increased thrust and decreased fuel consumption. These engines are high bypass turbofans which eliminate much of the "shearing" noise created by hot exhaust gases as they leave the core of the jet engine.⁸³ Such noise cannot be effectively reduced by the application of sound absorbing materials in the engine nacelles.⁸⁴ Through this technique engine noise can be significantly

4,000 barrels per day, which could approach approximately \$20 million extra cost per year (depending on fuel costs). *Airport & Aircraft Noise Reduction: Hearings before the Subcomm. on Aviation of the House Comm. on Public Works and Transportation*, 95th Cong., 1st Sess. 67 (1977) (statement by W.L. Rodenbaugh [hereinafter cited as Rodenbaugh]).

⁸⁰ *Airport & Aircraft Noise Reduction: Hearings before the Subcomm. on Aviation of the House Comm. on Public Works and Transportation*, 95th Cong., 1st Sess. 54 (1977) (statement by David J. Hines) [hereinafter cited as Hines].

⁸¹ The JT8D-209 is a derivative of the existing JT8D engine which powers the Boeing 727 and 737 and the McDonnell Douglas DC-9. It employs a new single stage fan and low rotor with existing JT8D engine core to produce 18,000 pounds of thrust, and substantial noise reduction along with fuel consumption improvements compared with basic JT8D models. *Id.* at 50, 51, and 53.

⁸² The CFM56 is an all-new high bypass ratio engine with a maximum thrust of 22,000 pounds and an increased fuel efficiency of 15-25% over existing engines in the same size class. Rodenbaugh, *supra* note 79, at 66.

⁸³ The "shearing" noise of turbojet engines is significantly reduced in the high bypass engine by extracting energy from the high velocity jet core to drive the fan. This increases the engine airflow and surrounds the lower velocity jet exhaust with a ring of even lower velocity cold air expelled by the fan. Rodenbaugh, *supra* note 79, at 67.

⁸⁴ The "shearing" noise created by turbofan engines is not a radated sound and for this reason cannot be effectively controlled by sound absorbing materials. *Id.*

reduced to levels below those proposed by the FAA,⁸⁵ and without the use of sound absorbing materials in the engine nacelles.

Although the retrofitting of aircraft with newer engines provides both a substantial increase in operating efficiency for existing aircraft and a drastic reduction in noise emitted, the costs of such an endeavor are significant. To retrofit a McDonnell Douglas DC-8 with GE/SNECMA CFM56 refanned engines would cost \$7.8 million per aircraft, nearly one-third the cost of a replacement aircraft.⁸⁶ However, the benefits would be substantial in terms of decreased noise; eleven to fifteen EPNdB.⁸⁷ A similar retrofit of the CFM56 engine to the Boeing 707 would be comparably priced and is in the development stages.⁸⁸ When coupled with fleet life extension programs, the retrofitting of existing aircraft with new technology engines provides an economically improved aircraft for use into the late 1980's and beyond. This alternative would provide a more cost efficient means of complying with FAR 36 noise levels over the long-term use of the aircraft.

The best solution for meeting FAR 36, from the air carrier's viewpoint, is the replacement of noncomplying and aging aircraft with technologically advanced equipment that reduces both fuel consumption and the number of persons in an area heavily affected by aircraft noise.⁸⁹ At present the only available replacement aircraft which will meet the FAR 36 noise standards include the last generation of wide-bodied aircraft⁹⁰ and the newer versions of the Boeing 727.⁹¹ None of these aircraft, however, are within the range classification and the seating capacity deemed desirable

⁸⁵ Notice For Proposed Rulemaking No. 76-22, 41 Fed. Reg. 47,358 (1976).

⁸⁶ J.P. Geddes, *U.S. Aerospace Looks Forward to 1985*, 32 INTERAVIA 574 (1977).

⁸⁷ *Aircraft Noise Abatement: Hearings before the Subcomm. on Aviation and Transportation R & D of the House Comm. on Science & Technology*, 94th Cong., 1st Sess. 171 (1975) (statement by Aubert L. Pike).

⁸⁸ Boeing Commercial Airplane Company signed a contract with General Electric and SNECMA in early 1977 for the development and flight testing of a CFM56 powered B-707. *News in Brief*, 32 INTERAVIA 764 (1977).

⁸⁹ *Airport & Aircraft Noise Reduction: Hearings before the Subcomm. on Aviation of the House Comm. on Public Works & Transportation*, 95th Cong., 1st Sess. 30 (1977) (statement by John C. Brizendine) [hereinafter cited as Brizendine].

⁹⁰ These include the Boeing 747, McDonnell Douglas DC-10, Lockheed L-1011, and the Airbus A.300 for both long- and short-haul requirements.

⁹¹ See generally Brizendine, *supra* note 89, at 31.

by the commercial carriers. The Boeing 727 is a 135 seat aircraft, while the wide-bodied aircraft seat in excess of 275 passengers. These capabilities are outside the 140 to 200 seat limit of the aircraft projected to provide fifty percent of the world market through the 1980's.⁹² At least for the present, the airlines must choose either smaller aircraft which provide unsatisfactory service for the passenger, or wide-bodied aircraft which lose money.

To meet the industry's need for increased capacity on short-haul routes the aerospace companies will likely develop derivatives of existing aircraft. Both the Boeing 737-300⁹³ and the McDonnell Douglas DC-9-80⁹⁴ are stretched versions of existing aircraft with a modified wing and new technology engines. For a medium to long range replacement for the aging Boeing 707 and McDonnell Douglas DC-8, the aerospace companies have proposed the development of an entirely new generation of aircraft in the 200 seat category.⁹⁵ The development costs for such a new generation aircraft will total approximately \$2 billion for design and tooling by industry estimates.⁹⁶ In comparison it cost \$1.8 billion to develop the DC-10 Series 10, 30, and 40 aircraft, a project that would cost \$3.6 billion today.⁹⁷ The cost of purchasing such a new aircraft would be about \$90,000 per seat, or \$18 million for a 200 seat aircraft, plus thirty-four percent of that figure for spare parts, new ground support equipment, and new facilities.⁹⁸ Thus,

⁹² J.P. Geddes, *U.S. Aerospace Looks Forward to 1985*, 32 INTERAVIA 577 (1977).

⁹³ The Boeing 737-300 will be an enlarged version of the present 737-200 powered by the JT8D-209 engine. It will carry about 140 passengers over 1500 nautical miles. See *The World of Aerospace*, 32 INTERAVIA 559 (1977).

⁹⁴ The DC-9-80, powered by the JT8D-209 engine, is a stretched version of the DC-9-50. It will carry 137 passengers in mixed seating (170 in economy) a distance of 1700 nautical miles. At present, McDonnell Douglas has received 27 firm orders and nine options for the aircraft with initial deliveries scheduled for 1980. D.E. Fink, *DC-9-80 Stretch Gets Go-Ahead*, AV. WEEK & SPACE TECH., Oct. 24, 1977, at 26.

⁹⁵ These designs include the Boeing 767 and 777 (for a general description of these aircraft see 33 INTERAVIA 154-155), the McDonnell Douglas DC-X-200 and the Airbus A.300-B10X. In addition, Lockheed proposes a two-engine version of its L-1011 design.

⁹⁶ J.P. Geddes, *U.S. Aerospace Looks Forward to 1985*, 32 INTERAVIA 574 (1977).

⁹⁷ *Id.*

⁹⁸ *The Future of Aviation: A Compilation of Papers Prepared by the Subcomm. on Aviation and Transportation R & D of the House Comm. on Science*

the cost of a new replacement aircraft for the 508 Boeing 707 and 720 and McDonnell Douglas DC-8s presently in service⁹⁹ will exceed \$12 billion in present dollars. The investment of these tremendous sums of money does not include the cost of modifying the 1,078 noncomplying two- and three-engine aircraft to meet FAR 36 guidelines, or the expenditures necessary for growth in the industry.

For this reason it is impractical to replace all of the four-engine turbojet aircraft which do not comply with FAR 36. There is general agreement between the government and the industry that to retrofit these aging aircraft (Boeing 707's and McDonnell DC-8's) with quiet nacelles would not provide the best utilization of existing resources.¹⁰⁰ Rather, given adequate financing, the air carriers have indicated they would replace approximately two-thirds of the older four-engine Boeing 707 and McDonnell Douglas DC-8 aircraft and retrofit the remainder with new technology engines at a cost of about \$7.2 billion.¹⁰¹ In addition, all two- and three-engine DC-9s, Boeing 737s, and Boeing 727s which do not presently comply with FAR 36 standards would likely be retrofitted with quiet nacelles at a cost of approximately \$268 million.¹⁰² Such a combination of retrofitting aircraft with both quiet nacelles and new technology engines and replacement of obsolete aircraft would provide the best solution to meeting the requirements of FAR 36. This approach will allow for the application of new advanced technology which will aid in the alleviation of increasing operational costs.

Without taking into account the federal noise requirements, the FAA estimates that between 1976 and 1985 the trunk carriers will need from 700 to 800 new aircraft to meet the projected in-

and Technology, 94th Cong., 2d Sess. 122 (1976) (statement by Andrew M. de Vorsney).

⁹⁹ Estimate by the FAA. See note 16 *supra*.

¹⁰⁰ *Airport & Aircraft Noise Reduction: Hearings before the Subcomm. on Aviation of the House Comm. on Public Works and Transportation*, 95th Cong., 1st Sess. 525 (1977) (statement by Brock Adams) [hereinafter cited as Adams].

¹⁰¹ *Id.*

¹⁰² CIVIL AERONAUTICS BOARD, AIRLINE EQUIPMENT NEEDS AND FINANCING THROUGH 1985 at v (1976).

crease in traffic¹⁰³ and the replacement of aging aircraft.¹⁰⁴ The cost of these aircraft has been estimated at \$32 billion by the FAA.¹⁰⁵ Of this amount, the FAA estimates that the airlines are capable of internally generating approximately \$15 billion through depreciation and the sale of used aircraft.¹⁰⁶ This would leave \$17 billion to be generated from the airline's net earnings and external sources of financing to meet the industry's 1985 fiscal requirements.¹⁰⁷ When one analyzes these capital requirements in light of the present earnings of the industry, it becomes obvious that much of the necessary capital to finance the acquisition of new equipment, as well as the cost of compliance with FAR 36 noise standards, will have to come from new sources outside the airline industry.

*Proposed Means of Financing Compliance
with FAR 36 Requirements*

Historically, the airline's prime source of funds for financing aircraft purchases and fleet modernization has been from internal cash generation; i.e., depreciation and net earnings.¹⁰⁸ These internal funds have been supplemented by commercial bank loans,

¹⁰³ Projected traffic growth has been estimated at approximately 5.6% per year, as measured in revenue passenger miles, to 1985. *Id.* at 1.

¹⁰⁴ U.S. DEP'T OF TRANSPORTATION, AVIATION NOISE ABATEMENT POLICY 25 (1976).

¹⁰⁵ *Id.*

¹⁰⁶ *Id.* at 26.

¹⁰⁷ Source and Uses of Funds (Mid-Range Estimates)

<i>Use of Funds:</i>	(\$ Billions)
Property, Plant & Equipment	\$26
Debt repayment and Other	6
	<u>\$32</u>
<i>Source of Funds:</i>	
Depreciation and Sale of Used Aircraft	\$15
Amount Required from Earnings & External Sources	\$17
Earning Assumption*	6
	<u>\$11</u>
<i>External Financing Requirement</i>	

* Assumes a 9% return on equity when the average rate of return for the past five years has been 2.8%. It also assumes no substantial increase in fuel or other costs or another recession.

U.S. DEP'T OF TRANSPORTATION, AVIATION NOISE ABATEMENT POLICY 26 (1976).

¹⁰⁸ *The Future of Aviation: Hearings Before the Subcomm. on Aviation and Transportation R & D of the House Comm. on Science & Technology*, 94th Cong., 2d Sess. 87 (1976) (statement by Frederick W. Bradley, Jr.) [hereinafter cited as Bradley, *Future of Aviation*].

long term loans from institutional lenders, the sale of equity and convertible subordinated debentures in the public market, and leasing.¹⁰⁹ At present, the airlines do not possess sufficient internal resources,¹¹⁰ nor do they have access to the normal capital markets, to finance major new programs.¹¹¹ Due to the difficulty in obtaining financing from these traditional sources the airlines will be forced to look to alternate means of obtaining capital to meet the cost of complying with noise emission requirements and purchasing new equipment. A number of possible alternative capital sources have been suggested to supplement income generated by the airlines and what private financing is made available. The use of funds from the Airport and Airway Trust Fund,¹¹² the implementation of a two percent surcharge on air fares and waybills, government guaranteed loans for purchasing replacement aircraft, and tax incentives are all methods proposed by the federal government to aid in alleviating the air carrier's financial burden.

The use of the uncommitted balance of funds available from the Airport and Airway Trust Fund is one of the methods recommended to aid the airlines in complying with the FAR 36 noise requirements. As of October 1, 1976, the trust fund surplus was \$1.334 billion with projected surplus revenues of an additional \$777 million in the next four years.¹¹³ These funds, as proposed by Rep. Mineta in H.R. 14027,¹¹⁴ would be applied to financing either the retrofit of existing aircraft or the replacement of non-complying aircraft. The amount of capital applicable to any single aircraft would not exceed the cost of retrofitting that aircraft with quiet nacelles.¹¹⁵ This bill, if enacted, would authorize \$300 million a year for the fiscal years 1977 through 1980 with a five year mandatory timetable for compliance.¹¹⁶ At the end of this five year

¹⁰⁹ *Id.*

¹¹⁰ U.S. DEP'T OF TRANSPORTATION, AVIATION NOISE ABATEMENT POLICY 25 (1976).

¹¹¹ See Bradley, *Aviation Economics*, *supra* note 29, at 584-87.

¹¹² Airport and Airway Development Act of 1970, Pub. L. No. 91-258, Tit. III, sec. 207, 84 Stat. 250 (1970).

¹¹³ *Aircraft Noise: Hearing before the Subcomm. on Aviation of the House Comm. on Public Works and Transportation*, 94th Cong., 2d Sess. 11 (1976) (statement by Norman Y. Mineta) [hereinafter cited as Mineta].

¹¹⁴ H.R. 14027, 94th Cong., 2d Sess. (1976).

¹¹⁵ Mineta, *supra* note 113, at 11.

¹¹⁶ *Id.* at 13.

period the bill would automatically terminate with 100 percent compliance with the FAR 36 standards having been achieved.¹¹⁷

Government loan guarantees and tax incentives would provide further relief to allow the retrofitting of existing noncomplying aircraft and the purchase of new equipment. The Aircraft Guarantee Loan Act of 1957¹¹⁸ could provide government-guaranteed loans for purchasing new equipment if it were modified to include all air carriers.¹¹⁹ The act would also have to be modified to include higher borrowing limits, since at present each qualified air carrier is entitled to borrow only \$10 million. In addition, tax incentives have been created. The airlines can now apply their oldest tax investment credits¹²⁰ first, thus reducing the chances that credits will expire before they can be used.¹²¹ For 1977 and 1978, the carriers can offset 100 percent of their federal tax bills with available credits, rather than the former fifty percent maximum.¹²² A refund of these investment credits can be utilized to boost the industry's profits. Such an increase in profits will aid in the financing of the necessary retrofitting or replacement of noncomplying aircraft with FAR 36.

At present, however, it would seem that the primary means of government financial assistance to the air carriers will come in the form of the two percent surcharge on air fares and waybills. The Department of Transportation has recommended this concept in

¹¹⁷ The eight year time schedule imposed by the FAA at 14 C.F.R. § 91.305(b) to meet FAR 36 noise limits is longer than the proposed five year plan of H.R. 14027. This conflict, as well as others, contributed to the failure of H.R. 14027 to reach the House floor for debate.

¹¹⁸ Aircraft Guarantee Loan Act of 1957, Pub. L. No. 85-307, 71 Stat. 629 (1957).

¹¹⁹ As enacted, the Aircraft Guarantee Loan Act of 1957 restricts the guarantee of loans to aircraft purchased by local, feeder, or short-haul air transportation companies. Aircraft Guarantee Loan Act of 1957, Pub. L. No. 85-307, § 1, 71 Stat. 629 (1957).

¹²⁰ INTERNAL REVENUE CODE § 46(a)(1) (Prentice-Hall 1977).

¹²¹ T. Canning, *Air Transportation Analysis*, STANDARD & POORS INDUSTRY SURVEYS A64 (1977). Approximately \$680 million in investment tax credits were to expire between 1975 and 1981. Without such a modification in the tax laws, a large percentage of these tax credits would have been lost. *Aviation Economics: Joint Hearings Before the Subcomm. on Investigations & Review and the Subcomm. on Aviation of the House Comm. on Public Works & Transportation*, 94th Cong., 2d Sess. 131 (statement by E.E. Carlson).

¹²² T. Canning, *Air Transportation Analysis*, STANDARD & POORS INDUSTRY SURVEYS A64 (1977).

its proposal to Congress for financing compliance with FAR 36.¹²³ That proposal, in addition to recommending the two percent surcharge, outlines a program which includes:

- (1) a \$2 surcharge on international departures;
- (2) a reduction of the current passenger ticket and waybill tax by two percentage points for all airlines;
- (3) a requirement that airlines requesting the surcharge, under guidance of the CAB, deposit revenues from the surcharge in a separate environmental fund;
- (4) a provision permitting the use of monies in these funds to pay up to 100 percent of the cost of retrofitting existing aircraft that do not meet FAR 36 standard; up to thirty-five percent of the cost of acquiring replacement aircraft which comply with FAR 36 standards; or up to the full cost of retrofitting present aircraft with new technology engines (provided such engines enable the aircraft to comply with FAR 36 standards), but not to exceed an amount equal to the allowances for a suitable replacement aircraft; and
- (5) a provision requiring any airline whose surcharge revenues reach an amount equal to the allowable costs under this proposal to terminate its surcharge.¹²⁴

This program, if enacted, would aid in assuring compliance with the FAR 36 noise standards by the airlines within the time limits established by the FAA. It would provide an incentive for replacement of obsolete and noisy aircraft with new technologically advanced equipment. In addition, it would place the burden of financing on the users of the industry's services without increasing airfare and waybill prices.

A similar program has been proposed by Rep. Anderson in the House of Representatives.¹²⁵ In his bill there would also be three options for compliance: the retrofitting of aircraft with sound absorbing material, retrofitting of aircraft with new technology engines, or the replacement of aircraft which do not presently comply with FAR 36.¹²⁶ As in the Department of Transportation's proposal, the funding would be provided by a two percent sur-

¹²³ Adams, *supra* note 100, at 525.

¹²⁴ *Id.*

¹²⁵ H.R. 8729, 95th Cong., 1st Sess. (1977).

¹²⁶ H.R. 8729, Tit. III, § 302(b)(1)(B) (1977).

charge on air fares and waybills.¹²⁷ However, the bill would allow the funding of only fifty percent of the cost of retrofitting any given aircraft.¹²⁸ In the case of retrofitting existing noncomplying aircraft with new technology engines, seventy-five percent of the cost of retrofitting would be allowed. This allowance, however, shall not exceed forty percent of the cost of replacing that aircraft with a comparable aircraft.¹²⁹ To replace a non-complying aircraft with a complying aircraft, forty percent of the cost of a replacement aircraft, which complies with Amendment 36-7¹³⁰ of FAR 36, would be allowed.¹³¹ Here, as in the Department of Transportation's proposal, the funds would be deposited in a separate account. Unlike the Department of Transportation's proposal, however, funds collected in excess of the maximum amount needed by any single carrier would be transferred to the Airport and Airway Trust Fund.¹³² The further difference between the Department of Transportation's proposal and H.R. 8729 is that the latter restricts the seating capacity of the replacement aircraft to an increase of only seven percent,¹³³ thus allowing funds generated under the bill to be applied only to replacement of non-complying aircraft with similar sized aircraft.

This bill provides a substantial amount of financial aid to the airlines for compliance with FAR 36, but severely restricts its use by the air carriers. The emphasis is placed upon retrofit and not upon the utilization of new technologically advanced equipment through the retrofitting of existing aircraft with newer engines or the replacement of noncomplying aircraft.

In addition to H.R. 8729, two other bills have been introduced in Congress to establish a program for the reduction of aircraft noise.¹³⁴ These bills would provide a program for reduced noise by amending the Federal Aviation Act of 1958 and the Airport and

¹²⁷ H.R. 8729, Tit. III, § 303(a)(1) (1977).

¹²⁸ H.R. 8729, Tit. III, § 303(b)(2)(A) (1977).

¹²⁹ H.R. 8729, Tit. III, § 303(b)(2)(B) (1977).

¹³⁰ 42 Fed. Reg. 12,360 (1977).

¹³¹ H.R. 8729, Tit. III, § 303(b)(1)(C) (1977). Only 25% of the cost of replacement would be allowed for an aircraft which does not meet Amendment 36-7 (42 Fed. Reg. 12,360 (1977)) to FAR 36.

¹³² H.R. 8729, Tit. III, § 303(b)(5) (1977).

¹³³ H.R. 8729, Tit. III, § 303(c)(1) (1977).

¹³⁴ S. 747 and H.R. 3802, 95th Cong., 1st Sess. (1977).

Airway Development Act of 1970.¹³⁵ Both bills have been sent to committee; H.R. 3802 to the House Committee on Public Works and Transportation, and S. 747 to the Senate Committee on Commerce, Science, and Transportation.¹³⁶

The above proposals utilize federal aid to the airline industry. In order to supplement the funding generated by federal legislation there must be some program of self-help established by the air carriers. The allowance of timely rate increases by the CAB to offset the ever increasing operational expenses incurred due to inflation and increased operating expenses is necessary.¹³⁷

To further combat the inflationary impact upon the acquisition of new technologically superior equipment, an alteration in the present depreciation accounting method should be implemented. At present it is impossible to replace an existing aircraft with the same type aircraft after depreciation over a twelve to fifteen year period (the industry standard)¹³⁸ due to inflation.¹³⁹ The depreciation costs are understated since depreciation is based upon the historical purchase price of an asset rather than the current acquisition costs of that asset.¹⁴⁰ An alteration in accounting practices to alleviate the impact of inflation would aid in the generation of internal capital by taking into consideration the rate of inflation when depreciating equipment, and thus reflecting the true replacement cost of an asset.

A combination of self-help programs in the airline industry, when coupled with the proposed federal legislation to aid in the financing of the compliance with FAR 36, will provide the necessary funding for timely compliance. The replacement of aging air-

¹³⁵ CONGRESSIONAL INDEX (CCH) 14,182 and 28,360 (1977-78).

¹³⁶ *Id.*

¹³⁷ At present, it appears that airline operating costs are rapidly outpacing the general inflationary rate. Bradley, *Future of Aviation*, *supra* note 108, at 96.

¹³⁸ Aircraft retirement was based in the past on a 15 year life, but has now been extended to 17 or 18 years, with some aircraft even going up to 20 years. J.P. Geddes, *U.S. Aerospace Looks Forward to 1985*, 32 INTERAVIA 577 (1977).

¹³⁹ *Future of Aviation: Hearings Before the Subcomm. on Aviation & Transportation R. & D. of the Comm. on Science & Technology*, 94 Cong., 2d Sess. 291 (1976) (statement by Frank Borman).

¹⁴⁰ In the period from 1965 to 1974, depreciation was understated at the actual inflation levels experienced by over 1.1 billion. *The Future of Aviation: A Compilation of Papers prepared by the Subcomm. on Aviation and Transportation R & D of the House Comm. on Science and Technology*, 94th Cong., 2d Sess. 241 (1976) (statement by Klaus P. Heiss).

craft and the retirement of present long-term debts will absorb the profits which the airlines are presently generating. Financing from institutional lenders for the retrofitting of existing noncomplying aircraft cannot be obtained.¹⁴¹ Likewise, commercial bank financing is impossible to obtain for those airlines with uncommonly high debt to equity ratios,¹⁴² and difficult at best for the remainder of the air carriers due to a loss of investor confidence in the industry.¹⁴³ Therefore, some form of a federal aid program for the financing of noise abatement programs will be necessary for the airline industry to meet the requirements of the federal government's noise abatement policy.

Conclusion

The industry has shown a slight profit margin in 1976,¹⁴⁴ and through three-quarters of 1977 the industry is showing a further increase in profits.¹⁴⁵ Given this increase in profit margins, and assuming it will continue without a substantial increase in operational costs, it is possible that the industry can meet the replacement requirements of some 500 aircraft. To expect the airlines to generate sufficient capital internally to meet these replacement requirements, however, let alone present debt obligations and a federally imposed noise abatement policy, is unrealistic.¹⁴⁶ The carriers are not in a position to handle retrofit, a replacement pro-

¹⁴¹ Insurance lenders have flatly stated that they will not finance retrofit. *Airport & Aircraft Reduction: Hearings before the Subcomm. on Aviation of the House Comm. on Public Works and Transportation*, 95th Cong., 1st Sess. 171 (1977) (statement by John S. Bliven) [hereinafter cited as Bliven].

¹⁴² A ratio ranging from 1.5:1 to 1.75:1, defined as total debt, including capitalized aircraft leases, to net worth, has been considered prudent for the airline industry compared to a ratio of 1 to 1 for most borrowers. *Airport & Aircraft Noise Reduction: Hearings before the Subcomm. on Aviation of the House Comm. on Public Works and Transportation*, 95th Cong., 1st Sess. 176 (1977) (statement by Frederick W. Bradley, Jr.).

¹⁴³ Bradley, *Aviation Economics*, *supra* note 29, at 589.

¹⁴⁴ See text accompanying note 57 *supra*.

¹⁴⁵ The domestic trunks have experienced a 6% gain in revenue passenger miles in the first nine months of 1977. International travel has been growing faster, with a 7.1% gain in the first nine months. *Wall St. J.*, Oct. 27, 1977, at 25, col. 1.

¹⁴⁶ Despite this increase in profits, the industry's earnings are still significantly below the CAB's recommended return on investment of 12% for a healthy industry.

gram, and commit to a new technology aircraft.¹⁴⁷ Outside sources of financing will not be available to meet these demands until the confidence of the leading community can be regained. To do so will require a substantial increase in profit and a corresponding decrease in debt of the industry. At the same time, the uncertainty of deregulation must be removed from the industry. Without such happenings, the future of the aviation industry will remain clouded.

To insure a future healthy industry, the airlines will have to receive further rate increases from the CAB.¹⁴⁸ With an increased profit margin and an alteration in present accounting procedures, the industry can generate the necessary internal capital to reduce the present debt to equity ratios. With a decrease in these ratios, long-term financing will again become available as the lending institution's confidence in the industry returns.

In the short term, federal funding will be necessary to aid the industry in meeting the noise standards imposed by the FAA. A program similar to that proposed by the Department of Transportation¹⁴⁹ would allow for a reasonable assurance of timely compliance by the air transportation industry. This would be done without the depletion of the Airport and Airway Trust Fund reserves, without any one element of the industry subsidizing another element, without a related increase in airfares, and with only a minimum of federal involvement. Such a proposal allows the industry to determine its needs and how best to meet the standards established by the FAA. At the same time, the industry would be encouraged to utilize new noise reduction technology on existing aircraft and in replacement aircraft. Without such a program, the airlines will not be capable of generating the necessary capital to comply with the federally imposed noise abatement policy and meet future fleet modernization and equipment needs.

¹⁴⁷ Bliven, *supra* note 141, at 171.

¹⁴⁸ These rate increases should be based upon future inflationary cost rises, not on past increases in operational expenses as has been the standard practice by the CAB. See R.K. Ellingsworth, *Shifts in Fare Standards Seen*, AV. WEEK & SPACE TECH., Aug. 29, 1977, at 24.

¹⁴⁹ Adams, *supra* note 100, at 524.